

FINAL REPORT

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PRESENTED TO

GEORGE C. MARSHALL SPACE FLIGHT CENTER
MARSHALL SPACE FLIGHT CENTER
ALABAMA 35812

IN FULFILLMENT OF

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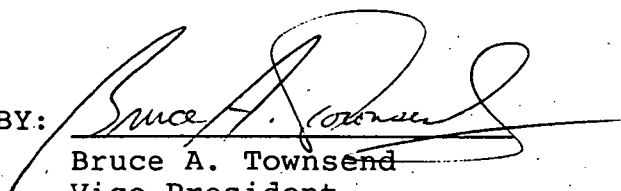
TITLE

DEVELOPMENT OF STANDARDIZED SPECIFICATIONS
FOR SCREENING SPACE LEVEL INTEGRATED
CIRCUITS AND SEMICONDUCTORS

DATED

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FORWARD

This document is intended to establish standardized methods for screening of JAN B microcircuits and JANTXV semiconductor components for space mission or other critical applications when JAN S devices are not available. General specifications are provided which outline the DPA (Destructive Physical Analysis , environmental, electrical, and data requirements for screening of various component technologies. This standard has been developed for Air Force Space Division, and is available for use by other DOD agencies, NASA, and space systems contractors for establishing common screening methods for electronic components.

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SECTION I

STANDARD SCREENING DOCUMENTS

SECTION I

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1.0 SCOPE

1.1 Scope - This standard provides screening methods for space mission or other critical applications of JAN B (Mil-M-38510) microcircuits and JANTXV (Mil-S-19500) semiconductors in Air Force Space Division systems contractors for applicability to other than AF/SD missions.

1.2 Part Number - Devices having successfully completed destructive physical analysis, screening, and quality conformance requirements of Section 3.0 of this specification shall be remarked as shown in examples below indicating selection for space mission or other critical application.

Microcircuits

was:	JM38510/00101BAC	- JAN B mark.
is:	AFSP/00101BAC	- Air Force selected mark.

Transistors

was:	JANTXV2N2222A	- JAN TXV mark.
is:	AFSP2N2222A	- Air Force selected mark.

Diodes

was:	JANTXV1N4150	- JAN TXV mark.
is:	AFSP1N4150	- Air Force selected mark.

1.2.1 The original "J" or "JAN" marking shall be obliterated or removed, and the device permanently and legibly remarked as specified indicating successful completion of all DPA, screening, and lot quality conformance testing.

1.2.2 When specified and/or authorized by the procurement agency contracting officer, a contractor's unique SCD (Specification Control Drawing) number may be used in lieu of the mark specified above to maintain traceability and control of the devices being screened and selected for critical applications.

2.0 APPLICABLE DOCUMENTS

- 2.1 Issues of Documents - The following documents, of the issue in effect on the date of invitation for bids or request for proposal form a part of this drawing to the extent specified herein.

SPECIFICATIONS

MIL-M-38510	Microcircuits, General Specification for.
MIL-M-19500	Semiconductor Devices, General Specifications for.

STANDARDS

MIL-STD-883	Test Methods and Procedures for Micro-Electronics.
MIL-STD-750	Test Methods for Semiconductor Devices.
MIL-STD-202	Test Methods for Electronic and Electrical Component Parts.
MIL-STD-1580	DPA Requirements for Space Applications.

- 2.2 Reference Documents - Applicable sections, as specified in the contract or purchase order, of the following documents may apply or be used as reference in establishing acceptable quality assurance, calibration, and component handling methods and procedures for screening of critical electronic components.

QUALITY ASSURANCE AND EQUIPMENT CALIBRATION

MIL-I-45208	Inspection System Requirements.
MIL-Q-9858	Quality Program Requirements.
MIL-STD-45662	Calibration System Requirements.

ELECTROSTATIC DISCHARGE (ESD) PREVENTION AND CONTROL

DOD-STD-1686	ESD Control Program.
DOD-HDBK-283	ESD Control Handbook.

2.3 Order of Precedence - In the event of conflict between the requirements of this specification and other requirements, the precedence in which requirement documents shall govern, rank in the following order:

- a) Contract or purchase order.
- b) Detail specification.
- c) This specification.
- d) Applicable and reference documents in Sections 2.1 and 2.2.

3.0 REQUIREMENTS

3.1 DPA (Destructive Physical Analysis), screening, and quality conformance inspection requirements specified in Paragraphs 3.2 and 3.3 of this standard shall be performed only by Air Force-approved screening facilities which have been surveyed and certified to perform all requirements.

3.1.1 Certified screening facilities shall have a documented quality assurance plan and written operating procedures in accordance with the applicable requirements of Mil-I-45208, Mil-Q-9858, and NASA handbook NHB5300.4.

3.1.2 All parts being screened for space or other designated critical applications shall be handled as if ESD (electrostatic discharge)-sensitive, regardless of their ESD classification. Certified screening facilities shall have part-handling procedures documented and implemented in accordance with applicable requirements of DOD-STD-1683 and DOD-HDBK-283.

3.1.3 All data pertaining to the procurement, traceability, DPA, screening, lot quality conformance, and acceptance of components for space or other designated critical applications shall be retained at the supplier's facility for a minimum of three (3) years or as specified by purchase order or contract. Deliverable data shall be specified in purchase order or contract. Air Force or other designated agencies may audit data periodically as required.

3.2 DPA, screening, and lot quality conformance inspection requirements for JAN B integrated circuits.

3.2.1 Screening Process - MOS Integrated Circuits

SCREEN/TEST SEQUENCE	MIL-STD- 883 METHOD	REQUIREMENTS
1. Traceability		Traceability documentation shall include name of manufacturer, distributor, screening facility, and date code. Supplier's C of C required.
2. Electrical Test		Go-no-go static tests @ +25°C. Electrical criteria per applicable M38510 Class B slash sheet.
3. Prescreen DPA	5009 & MIL-STD-1580 2020	5 pc sample/0 rejects.
4. PIND		Cond. A or B, as specified in Purchase Order or Contract.
5. Serialization		
6. Radiographic	2012	Two Views.
7. Electrical Test Interim (pre-static burn-in I)		Read & record static tests @ +25°C. Electrical criteria per applicable M38510 Class B slash sheet.
8. Static Burn-in I (Inputs High)	1015	48 hrs minimum @ +125°C per applicable M38510 Class B slash sheet or an approved circuit. Cool-down with bias applied until $T_{case} \leq +35^{\circ}C$.
9. Electrical Test Interim (post static burn-in I)		Read & record static tests @ +25°C within 96hrs of removal of burn-in bias. Electrical and delta criteria per applicable M38510 Class B slash sheet.

SCREEN/TEST SEQUENCE	MIL-STD- 883 METHOD	REQUIREMENTS
10. Static Burn-in II (Inputs Low)	1015	48 hrs minimum @+125°C per applicable M38510 Class B Slash sheet or an approved circuit. Cool-down with bias applied until T case $\leq +35^{\circ}\text{C}$.
11. Electrical Test Interim (post static burn-in II)		Read & record static test @ +25°C within 96 hrs. of removal of burn-in bias. Electrical and delta criteria per applicable M38510 Class B slash sheet. PDA=10% and applies to post burn-in electricals and deltas for static burn-in I and II.
12. Dynamic Burn-in	1015	160 hrs. minimum @ +125°C per applicable M38510 Class B slash sheet. Cool-down with bias applied until T case $\leq +35^{\circ}\text{C}$.
13. Electrical Test Final		Read & record static tests @+25°C within 96 hrs of removed of burn-in bias. Go-no-go static tests @ hot and cold temperatures. Go-no-go switching test @ +25°C. Electrical and delta criteria per applicable M38510 Class B slash sheet. PDA=10% and applies to post dynamic burn-in electricals and deltas combined.
14. Fine Leak	1014	Condition A or B
15. Gross Leak	1014	Condition C
16. Mark		Per paragraph 1.2 for space level screening.
17. External Visual	2009	

SCREEN/TEST SEQUENCE	MIL-STD- 883 METHOD	REQUIREMENTS
<u>QCI</u> - Quality Conformance Inspection 1. Electrical Test 2. Temperature Cycling 3. Constant Acceleration 4. Fine Leak 5. Gross Leak 6. Electrical Test	883/5005 1010 2001 1014 1014	Sample size=15/0 rej. allowed. Go-no-go static tests @+25°C. Electrical criteria per applicable M38510 Class B slash sheet. Cond. C, 20 cycles min. Cond. E. Y1 axis only. However, do NOT exceed mechanical design limitations of the part. Condition A or B Condition C Go-no-go static tests @+25°C. Electrical criteria per applicable M38510 Class B slash sheet.
7. Destructive Physical Analysis	5009 & MIL-STD-1580	4 pc. sample/0 rejects.

3.2.2 Screening Process - Bipolar Integrated Circuits

SCREEN/TEST SEQUENCE	MIL-STD- <u>883</u> METHOD	REQUIREMENTS
1. Traceability		Traceability documentation shall include name of manufacturer, distributor, screening facility, and date code. Supplier's C of C required.
2. Electrical Test Prescreen		Go-no-go static tests @ +25°C. Electrical criteria per applicable M38510 Class B slash sheet.
3. Prescreen DPA	5009 & - MIL-STD-1580	5 pc sample/0 rejects.
4. PIND	2020	Condition A or B, as specified on Purchase Order or Contract.
5. Serialization		
6. Radiographic	2012	Two views
7. Electrical Test Interim (pre-burn-in)		Read & record static tests @+25°C. Electrical criteria per applicable M38510 Class B slash sheet.
8. Burn-in	1015	Cond. F. shall NOT be used. 160hrs. minimum per applicable M38510 Class B slash sheet. TA= +125°C. (For Linear Devices, as specified in applicable detail specification cool-down with bias applied until T case \leq +35°C.
9. Electrical Test Interim (post-burn in)		Read & record static tests @+25°C within 96 hrs. of removal of burn-in bias. Electrical and delta criteria per applicable M38510 Class B slash sheet. PDA=10% and applies to post burn-in electricals and deltas combined.

SCREEN/TEST SEQUENCE	MIL-STD- 883 METHOD	REQUIREMENTS
10. High Temperature Reverse Bias Burn-in	1015	Condition A or C. Cond. F shall not apply. 96 hrs minimum @+150°C per applicable M38510 Class B slash sheet or an approved circuit. However, the maximum junction temperature of the part shall NOT be exceeded. (For Linear Devices, as specified in applicable detail specification, cool-down with bias applied until T case \leq +35°C.
11. Electrical Test Final		Read & record static tests @ +25°C within 96 hrs of removal of burn-in bias. Go-no-go static tests @ hot and cold temperatures. Go-no-go switching tests @+25°C. Electrical and delta criteria per applicable M38510 Class B slash sheet.
12.. Fine Leak	1014	Condition A or B.
13. Gross Leak	1014	Condition C.
14. Mark		Per paragraph 1.2 For space level screening
15. External Visual	2009	

SCREEN/TEST SEQUENCE	MIL-STD- 883 METHOD	REQUIREMENTS
<u>QCI</u> -Quality Conformance Inspection	883/5005	Sample size = 15/0 rej. allowed
1. Electrical Test		Go-no-go static test @+25°C. Electrical criteria per applicable M38510 Class B slash sheet.
2. Temperature Cycling	1010	Cond. C, 20 cycles min.
3. Constant Acceleration	2001	Cond. E, Y1 axis only. However, do NOT exceed mechanical design limitations of the part.
4. Fine Leak	1014	Condition A or B.
5. Gross Leak	1014	Condition C.
6. Electrical Test		Go-no-go static test @+25°C. Electrical criteria per applicable M38510 Class B slash sheet.
7. Post-Screen DPA	5009 & MIL-STD-1580	4 pc sample/0 rejects.

3.3 DPA, screening, and lot quality conformance inspection requirements for JANTXV semiconductors.

3.3.1 Screening Process - Semiconductors, Transistors

SCREEN/TEST SEQUENCE	MIL-STD- 750* METHOD	REQUIREMENTS
1. Traceability		Check manufacturer's date code, C of C, authorized distributor, OEM and screening facilities for traceability.
2. Electrical Test (pre-screen)		+25°C, go-no-go, static tests per applicable 19500 slash sheet.
3. Pre-Screen DPA (sample)	MIL-STD 883 Method 5009	Applicable test methods of MIL-STD 750 and MIL-STD 1580. (Sample size = 5 pcs, 0 rejects allowed.)
4. Thermal Shock (temp. cycle)	MIL-STD 202	20 cycles, no dwell @+25°C. 10 minutes minimum dwell time. 5 minutes maximum transfer time.
5. PIND (cavity devices only)	2052	Cond. A or B as specified on Purchase Order or Contract.
6. Serialization		
7. X-Ray	2076	2 views required.
8. Electrical Test (interim elect)		+25°C, read & record, static and functional parameters per applicable 19500 slash sheet.
9. HTRB		48 hrs minimum TA=+150°C ± 3°C Bipolar=80% min. of rated VCB FETS=80% min. of rated VGS Maximum TA=+125°C for non-gold leads Approved circuit required. Maintain bias applied until devices have cooled to T case ≤ +35°C.

*MIL-STD-750, unless otherwise specified

SCREEN/TEST SEQUENCE	MIL-STD- 750* METHOD	REQUIREMENTS
10. Electrical Test (Interim elect)		+25°C, read & record, static and functional parameters per applicable 19500 slash sheet. (Electricals must be performed within 24 hrs after HTRB bias removal.)
11. Data Review - Delta Calculation & PDA		Delta criteria per slash sheet or approved specification. PDA = 10% for post HTRB electricals and deltas combined.
12. Power Burn-in	1039	168 hrs minimum per applicable 19500 slash sheet. Approved circuit required.
13. Electrical Test (Final elect)		+25°C, read & record static electrical parameters per applicable slash sheet. Go-no-go static parameters at high and low temperatures per applicable slash sheet. DC @+25°C must be performed within 96 hrs of power burn-in bias removal.
14. Data Review - Delta Calculation & PDA		Deltas per slash sheet or approved specification. PDA=10% for deltas combined and +25°C interim electricals.
15. Fine Leak (Cavity devices only)	1071	Cond. G or H.
16. Gross Leak (Cavity devices only)	1071	Cond. A, C, or E.
17. Marking		Per paragraph 1.2 For space level screening
18. Visual	2071	

SCREEN/TEST SEQUENCE	MIL-STD- <u>750*</u> METHOD	REQUIREMENTS
<u>QCI</u> -Quality Conformance Inspection		Sample size = 15/0 Rejects allowed
1. Electrical Test		Go-no-go static tests @+25°C Electrical criteria per applicable M19500/JTXV slash sheet.
2. Temperature Cycling	MIL-STD-202 Method 107	Cond. C, 20 cycles minimum. However, do NOT exceed temperature limits of the device. Maximum TA=+125°C for non-gold leads.
3. Constant Acceleration	2006	Cond. D, Y1 axis only. However, do NOT exceed mechanical design limitations of the device.
4. Fine Leak (cavity devices only)	1071	Cond. G. or H.
5. Gross Leak (cavity devices only)	1071	Cond. A, C, or E.
6. Electrical Test		Go-no-go, static parameters @+25°C Electrical criteria per applicable M19500/JTXV slash sheet.
7. DPA Post-Screen (sample)	MIL-STD-883 Method 5009 & MIL-STD-1580	4 pc sample/0 rejects.

3.3.2 Screening Process - Semiconductors, Diodes

SCREEN/TEST SEQUENCE	MIL-STD- 750* METHOD	REQUIREMENTS
1. Traceability		Check manufacturer's date code, C of C, authorized distribution, OEM and screening facilities for traceability.
2. Electrical Test (pre-screen)		+25°C, go-no-go static parameters per applicable 19500 slash sheet.
3. Pre-Screen DPA (sample)	MIL-STD-883 Method 5009	Applicable test methods of MIL-STD 750 and MIL-STD-1580. (Sample size = 5 pcs, 0 rejects allowed.)
4a. Thermal Stock (temp cycle) -or-	MIL-STD-202 Method 107	20 cycles, no dwell @ +25°C.
4b. Thermal Shock Glass Strain (axial lead glass diodes only)	1056	Cond. A - 10 cycles, 0°C to +100°C
5. PIND (cavity devices only)	2052	Cond. A or B as specified in Purchase Order or Contract
6. FIST (non cavity devices only)	2081	5 shocks of 1500 G's minimum (1/2 MSEC rise time) in each of two mutually perpendicular planes, monitored continuously during shock.
7. BIST (non-cavity devices only)		Vibration of 60 ±30 Hz, 0.1 inch displacement for 30 seconds minimum monitored continuously during vibration.
8. Serialization		
9. X-Ray	2076	2 views.

SCREEN/TEST SEQUENCE	MIL-STD- 750* METHOD	REQUIREMENTS
10. Electrical Test (interim elect)		+25°C, read & record static and functional parameters per applicable slash sheet.
11. HTRB		48 hrs. minimum @ $T_A = +150^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Zener diodes - 80% of nominal V_Z for V_Z greater than 10 volts (omit test for $V_Z \leq 10$ volts.) Diodes and rectifiers rated at less than 10 amps at T_{CASE} greater than $+100^{\circ}\text{C}$ - use 80% of rated V_{CB} . For all other, use test cond. A - rated working peak reverse voltage Approved circuit required. Maintain bias applied until devices have cooled to $T_{case} \leq +35^{\circ}\text{C}$
12. Electrical Test (interim elect)		+25°C, read & record static and functional parameters per applicable slash sheet. (Electricals must be performed within 24 hrs after HTRB bias removal.)
13. Data Review - Delta Calculation & PDA		Deltas per slash sheet or approved specification. PDA = 10% for post HTRB electrical and deltas combined.
14. Power Burn-in	1039	168 hrs. minimum per applicable slash sheet. Approved circuit required.
15. Electrical Test (final elect)		+25°C, read & record, static parameters per slash sheet. Go-no-go static parameters at high and low temperatures per applicable slash sheet. (DC @+25°C must be performed within 96 hrs of power burn-in bias removal.
16. Data Review - Delta Calculation & PDA		Deltas per slash sheet or approved specification. PDA = 10% for deltas and +25°C interim electricals combined.

SCREEN/TEST SEQUENCE	MIL-STD- <u>750*</u> METHOD	REQUIREMENTS
17. Fine Leak (cavity devices only)	1071	Cond. G or H. maximum leak rate= 5×10^{-8} atm cc/sec for devices with internal cavity less than 0.3cc. Maximum leak rate= 5×10^{-7} atm cc/sec for devices with internal cavity greater than 0.3cc.
18. Gross Leak (cavity devices only)	1071	Cond. A, C, or E. (For non-cavity devices, use Cond. E - penetrant die.)
19. Marking		Per paragraph 1.2
20. Visual	2071	For space level screening

SCREEN/TEST SEQUENCE	MIL-STD- 750* METHOD	REQUIREMENTS
<u>QCI</u> -Quality Conformance Inspection		Sample size = 15/0 rej. allowed
1. Electrical Test		Go-no-go static parameters @+25°C Electrical criteria per applicable M19500/JTXV slash sheet.
2. Temperature Cycling	MIL-STD-202 Method 107	Cond. C, 20 cycles minimum. However, do NOT exceed temperature limits of the device. Maximum TA= +125°C for non-gold leads.
3. Constant Acceleration	2006	Cond. D. Y1 axis only. However, do NOT exceed mechanical design limitations of the device.
4. Fine Leak (cavity devices only)	1071	Cond. G or H.
5. Gross Leak (cavity devices only)	1071	Cond. A, C, or E.
6. Electrical Test		Go-no-go static parameters @ +25°C. Electrical criteria per applicable M19500/JTXV slash sheet.
7. Post-Screen DPA	MIL-STD-883 Method 5009 MIL-STD-1580	4 pc sample/0 rejects allowed.

SECTION II

RECOMMENDED FORMAT

SELECTED ITEM DRAWING

				REVISIONS			
				Ltr	Description	Date	Approved
Selected Item Drawing							
Rev							
Page							
Rev Status of Pages	Rev Pages						
		Prepared by	(Issuing Authority) (-DESC, Aerospace, etc)				
		Checked by	Title Microcircuits, (Device Description) Critical Application, Screening, and Selection for				
		Approved by					
		Size Code Ident No.	Dwg No.				
		Rev	Page of				

1.0 SCOPE

1.1 Scope - This drawing describes the requirements for screening of (-description of the device-) for space mission or other critical applications. This drawing provides for an improved level of component quality and reliability assurance through selection of candidate components from production lots of (Mil-M-38510/Mil-S-19500) devices.

1.2 Part Number -

1.2.1 Device Type -

1.2.2 Case Outline -

1.3 Absolute Maximum Ratings -

1.4 Recommended Operating Conditions -

2.0 APPLICABLE DOCUMENTS

3.0 REFERENCE DOCUMENTS

4.0 REQUIREMENTS

TABLE I: DPA, SCREENING, AND QCI REQUIREMENTS
FOR (DEVICE DESCRIPTION)

DPA

Destructive Physical Analysis	5 Pieces - Zero Rejects
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Only lots which have successfully passed DPA will be submitted to the following screening flow.

SCREENING

Screen	Method	Requirements
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Specific flow developed in accordance with Mil-Std-"Space Parts" guidelines and reviewed and approved by the designated cognizant technical authority.

QCI

Quality Conformance Inspection - as defined in Mil-Std-"Space Parts".

NOTES:

4.1 Marking Requirements -

4.2 Packaging, labeling, and Handling Requirements -

4.3 Data Requirements -

5.0 PACKAGING FOR SHIPMENT

6.0 APPROVED SOURCES OF SUPPLY

SECTION III

SOURCES OF JAN PRODUCT

SECTION III
SOURCES OF JAN PRODUCT

It is required that all JAN components be purchased from either direct QPL sources (manufacturers) or from their franchised distributors only.

The following table identifies the QPL sources and their franchised distributors.

	All American	Almac	Anthem	Arrow	Beaver	Bell Ind	Graham	H/A	Hallmark	Kierueff	Marshal	Pioneer	RV Weatherford	Schweber	Summit	Time Elec	Western Micro	Wyle	Zeus
AMD		X		X				X	X	X				X				X	
FSC				X	X	X	X	X	X	X				X				X	X
Harris								X	X					X				X	
Intersil			X	X						X				X				X	
Intel		X		X				X		X								X	
Micro Services	X			X														X	X
Mot	X	X			X	X	X	X	X	X				X					X
NSC		X	X		X	X		X	X					X					
Raytheon				X	X	X			X	X							X	X	X
RCA	X			X	X		X	X		X				X				X	
Semtech																			
Signetics			X	X				X	X					X				X	
Siliconix						X		X										X	X
Solid State Sci	X				X														X
TI				X	X		X		X	X								X	
Uni				X				X										X	X
Zilog			X						X	X				X			X		

SECTION IV

DEFINITION OF CERTIFIED SCREENING FACILITIES

SECTION IV

SCREENING FACILITIES

For the purposes of this proposal, a certified screening facility will be defined as follows:

1. The facility must be fully capable of screening integrated circuits and discrete components to the full requirements of Mil-Std-883, Mil-M-38510, Mil-S-19500, Mil-Std-750, and Mil-Std-975, as applicable.
2. The facility must be able to meet the certification requirements of Section V of this proposal.
3. The facility must have demonstrated experience, management expertise, and technical ability to manage large screening contracts.
4. A Destructive Physical Analysis laboratory must be present within the facility.
5. The following independent screening facilities should be capable of meeting the requirements as defined above:
 - OMNI Technology
 - Viking Test Lab
 - Assurance Technology.

SECTION V

SCREENING FACILITY CERTIFICATION REQUIREMENTS

SECTION V

SCREENING FACILITY CERTIFICATION REQUIREMENTS

1.0 CERTIFIED SCREENING FACILITIES

Air Force Space Division shall survey and approve various independent test and DPA laboratories as "certified screening facilities" for space-level components. General quality assurance and certification requirements for these AF/SD-approved facilities are as follows.

- 1.1 Quality Assurance Program - AF/SD-approved screening facilities must have a quality assurance program in accordance with the applicable sections of MIL-Q-9858. This consists primarily of an established quality assurance organization with documented systems and procedures for controlling the quality of test and screening services, and for defining and implementing corrective actions as required. Quality assurance organizations, policies, and procedures shall be documented in an appropriate quality assurance manual.
- 1.2 Test and Inspection Procedures - AF/SD-approved screening facilities must have written procedures for all critical test and inspection operations in accordance with Mil-I-45208. This consists primarily of quality assurance instructions for receiving, in-process, and final inspections; and operator instructions for all critical test and inspection procedures. A documented lot traveller indicating the sequence of tests and inspections, with provision for test operator, quality assurance, and source inspection sign-off shall be a requirement.
- 1.3 Test Equipment Calibration System - AF/SD-approved screening facilities must have a test equipment calibration/recall system in compliance with Mil-Std-45662, providing traceability to NBS (National Bureau of Standards) on all test equipment used to perform mechanical, environmental, electrical, and other critical test and measurement operations on space-level components. Calibration traceability documentation shall be maintained and/or monitored by the quality assurance organization.

- 1.4 ESD Handling Methods for Space-Level Electronic Components - AF/SD-approved screening facilities must have an ESD (electrostatic discharge) control program implemented in accordance with the guidelines established in DOD-STD-1686 and DOD-HDBK-263. Grounded conductive work stations, grounded conductive test operator wrist straps, anti-static smocks, conductive or anti-static tote boxes, and/or other appropriate methods and equipment shall be implemented to limit or eliminate build-up of electrostatic charge in all areas where space-level components are handled.
- 1.5 Documentation, Data Retention, and Traceability - AF/SD-approved screening facilities must have an established document control system with procedures implemented to provide documented traceability of test data to all space-level screened components and/or lots. Data retention at approved screening facilities shall be three (3) years minimum for space-level components, or as specified and required by contract. Lot/component traceability documentation shall be reviewed and approved by the quality assurance organization, and data retention monitored on a periodic basis. Document control procedures must allow for review and/or approval of data by Air Force Space Division or its designated representatives at specified times during the component screening and evaluation process.

SECTION VI

IMPLEMENTATION BY USAF/DOD/NASA

SECTION VI

IMPLEMENTATION BY USAF/DOD /NASA

Upon acceptance of the general screening/quality conformance procedures and selected item drawing formats outlined in this report, it is assumed that an effort will be made to implement standard component screening procedures on various critical contracts and/or space programs. OMNI Technology recommends that the general screening procedures be issued as a Military Standard with DESC-EQ designated as the agent for establishment and maintenance/distribution of the standard and Air Force Space Division as the responsible activity for the standard. The technical capabilities and experience of such groups as Aerospace Corporation, Space Parts Working Groups, etc., could then be drawn upon to fully develop, review, update, and approve the standard as it is implemented in the defense community.

To avoid the cost and confusion of having each user develop specific screening specifications for individual part types or categories, it is recommended that selected item drawings be developed in accordance with the standard and be issued and distributed by an agency such as DESC-EQ. This would ensure that all programs/contracts requiring the screening standard as a compliance document could receive standardized screening instructions for all part types.

SECTION VII

CERTIFIED STOCKING FACILITY CONCEPT

SECTION VII

CERTIFIED STOCKING FACILITY CONCEPT

1.0 DEVELOPMENT OF "CERTIFIED STOCKING FACILITY"

Utilizing the specifications as outlined in this proposal, the creation of a "certified stocking facility" to stock screened components is recommended. This concept would enable the user community to have available space-level components with very short lead times at a greatly reduced price as compared to JAN Class S components.

- A. The proposed stocking facility should be highly experienced in parts management, electrical testing, environmental screening, and destructive physical analysis (DPA). In addition, the screening facility must meet the certification requirements as defined in Section V which defines the technical qualification of the screening facility.
- B. Utilizing a credible user forecast, part types and quantities can be identified as possible stocking candidates. It is anticipated that min/max inventories would be established and maintained.
- C. Delivery times of components would be greatly reduced since inventories of common-used components would be either in place at the stocking facility or on order based on the forecast.
- D. The pricing on stocked components would be at a negotiated fixed price where all users would be paying the same unit price. Minimum quantity orders and large minimum lot charges would be greatly reduced since the inventory would offset both the minimum quantity and minimum lot charges. This would create a large cost savings to the government agencies.

The funding for this concept would have to be negotiated with the USAF or NASA.

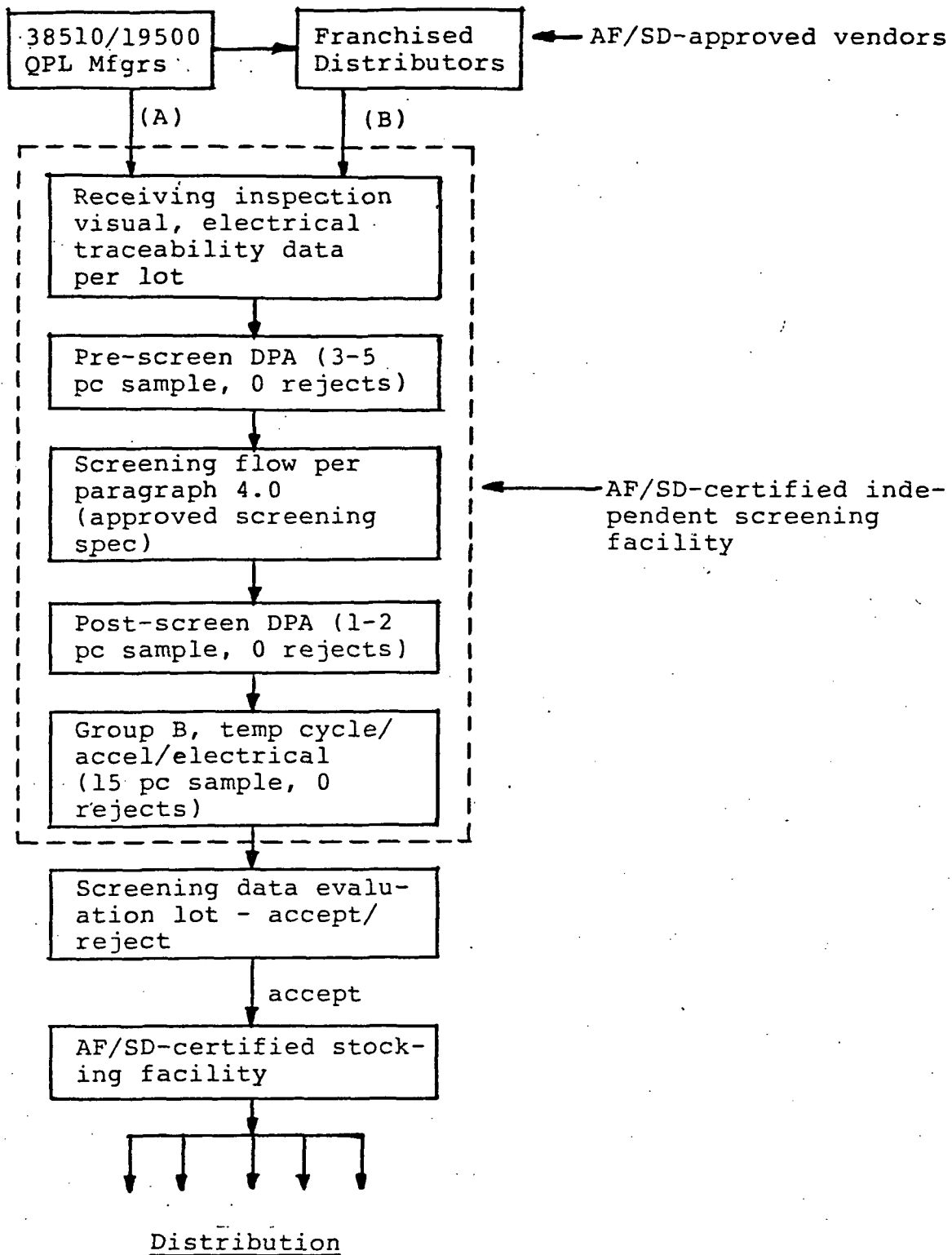


Figure 1: Screening Process Flow for JAN B Microcircuits and JANTXV Semiconductors for Space Applications